COLUMBIA RIVER REGIONAL FORUM
TECHNICAL MANAGEMENT TEAM
May 16, 2007 Meeting

FACILITATOR'S SUMMARY NOTES ON FUTURE ACTIONS
Facilitator: Robin Harkless

Review Meeting Minutes

May 2 Official Meeting Minutes:

- A question was raised about the Priest Rapids update, and whether the four weekend operations discussed were accurately reflected. Russell Langshaw, Grant County PUD, confirmed that he sent in revisions and with those changes, the May 2 Meeting Minutes were finalized.

May 9 Facilitator's Notes:

- Under "Snake River Transportation Operations", first paragraph: Little Goose started today (5/9), Lower Monumental would begin on 5/11.
- Second paragraph: Russ Kiefer shared concerns that with low snow pack in the Snake system, migration conditions for fish could deteriorate dramatically in late May .
- With the changes shared, the May 9 facilitator notes were finalized.

The May 9 Official Meeting Minutes and May 16 Facilitator's Notes will be finalized during the May 23 conference call.

Priest Rapids Update

Russell Langshaw, Grant County PUD, reported on operations from May 7-13, noting it was another good week with no exceedances. Weekend minimum protection flows were 150 kcfs during the weekend of May 4-5, with 60 kcfs bands the rest of the week. During the weekend of May 12-13, minimums were 170 kcfs. Russell will provide another update at the May 30 TMT meeting.

Sturgeon Pulse/Libby Operations

Cindy Henriksen, COE, recapped the USFWS SOR for sturgeon pulse operations submitted on 5/11 and discussed during the 5/14 TMT conference call. The SOR included input from the Kootenai Tribe, Montana, Idaho Fish and Game, and others. The recommendation was to begin the operation using water temperature as a trigger – a graphic was linked to the TMT agenda showing temperature data at varying levels in the Libby reservoir. Greg Hoffman, COE, added that the "sturgeon operation" was to not cool temperatures greater than 1.5º C at Bonners Ferry from releases at Libby. He reported that 8 females were in the hatchery at this point, and 6 were ready to spawn. Given current and near-term expected conditions, the operation was expected to start some time in the next few days, perhaps Monday, 5/21.

Process – As many of the parties would be meeting at Libby dam on Friday, it was agreed that the parties would discuss current conditions and decide when to start the operation, and a notice would be sent to TMT from the COE notifying them of the conditions and parties involved in coordination. *UPDATE*: An email was sent out from Cindy Henriksen

following today's meeting with a message from Jason Flory, USFWS, that the operation would begin at 0600 hours on Friday, 5/18, and that this had been agreed to by members of the Sturgeon Recovery Team.

Grand Coulee Flood Control

John Roache, BOR, reported on this week's flood control upper limit for Grand Coulee, a 1263' maximum (not target) for May 20. The COE added that the upper limit will be updated weekly with new information on current and expected runoff. Currently, the project was at elevation 1253.1' and filling.

Snake River Transportation Operations

Paul Wagner, NOAA, reported that per discussions last week, the tribes that signed on to the 2007 Agreement for spill through the spring season did not agree to a suggested alternative operation of maximizing transportation during the second half of May. Because there was no consensus to change course, NOAA shared instead an analysis of the issues to flag for future consideration and hopes of revisiting as lessons learned during the TMT year end review. A handout was linked to the agenda that summarized NOAA's analysis leading to a recommendation to maximize transportation in late May this year, based on a 2002 study of in-river and transported yearling chinook and steelhead with flow and temperature conditions similar to what is happening this year. (For more details on the analysis, see the handout).

Suggestions and requests were made for next steps forward on this issue:

- Share lessons learned at the TMT year end review.
- Add temperature charts to the NOAA analysis, as temperature is a contributing factor for survival of fish. Track this through the year and develop flow and temperature triggers for implementing transportation in future years.
- Consider using the COMPASS model to look at overall survival with or without transportation with this year's conditions.
- Develop a more formal SOR with technical justification to maximize transportation in late May, and allow each regional party to make a decision as to the most appropriate operation for this year. Share the outcome with the Court regardless of the decision.
- For the future, suggest also looking at subyearling chinook impacts during this late May timeframe.
- Request for more technical information and input from other salmon managers on this issue. What is the technical rationale for supporting/not supporting NOAA's proposed operation?

It was noted that the process for moving NOAA's recommendation forward this year would require agreement from the Court, through a court filing. Given the limited time frame this year, it was suggested that without consensus from signatories to the 2007 Agreement, implementing this alternative this year was unlikely.

Updated Flow Forecasts

The COE shared updated hydrographs and whiskers plots depicting flow forecasts for Libby, Dworshak, Hungry Horse and Lower Granite.

Dworshak Augmentation Volumes: This graph showed average Lower Granite flows for May 14-June 30 given minimum, average and maximum ESP volume forecasts. It was noted that the average flows included the 1.5 kcfs minimum required out of Lower Granite. This will be more clearly labeled on future graphs. Given the current forecast, outflows from Lower Granite could be maintained at 4.5 kcfs.

Libby Augmentation Volumes: This graph showed that June 30 refill will be a big question – deficits were shown in all years. A request was made to the COE to develop scenarios or "bookends" graphs, as in the past, for Libby operations. (The COE planned to develop the scenarios once the sturgeon pulse operation began – and will share them at a near-future TMT meeting.)

Lower Granite Whiskers Plot: The Lower Granite flow forecasts show a drop, then a spike up to 105 kcfs, followed by a drop off again and no more increases for the rest of the season. Actual flows were at 92 kcfs. Period average flows were 64 kcfs for spring and 30 kcfs for summer.

Dworshak Operations

The salmon managers discussed at FPAC and, given current conditions and diminishing water supply forecasts, recommended reducing outflows at Dworshak to around 5 kcfs for a week, and checking back in next week to reassess current conditions and forecasts.

Action: The COE planned to operate the big unit at Dworshak to best efficiency, at 5.4 kcfs. It was anticipated the request will be to further reduce outflows at the project in the next week or two.

Chum Emergence

Rick Kruger, Oregon, shared the latest information on chum counts, and officially declared that chum emergence had ended. With this declaration, the Bonneville tailwater restriction will be lifted and the COE will pull the Warrendale monitoring gauge. Sampling of chinook will continue in the area.

Operations Review

Reservoirs – Cindy Henriksen and John Roache reported on reservoirs. Libby inflows had increased to 38 kcfs and the project was at elevation 2400', releasing 14 kcfs until the start of the sturgeon operation. Grand Coulee was at elevation 1253.1' and slowly filling. Hungry Horse was at 3545.14', with 6.3 kcfs outflows and about 13 kcfs inflows. Flows at the project were increasing but expected to drop off. Lake Pend Oreille was continuing to fill to 2060' by the end of May, currently at elevation 2057.8'. Average flows April 20-May 15 were 171 kcfs at Priest Rapids, 70 kcfs at Lower Granite, and 253 kcfs at McNary. Dworshak was at elevation 1581', with about 14 kcfs inflows.

Fish – Paul Wagner reported on juvenile and adult fish. Yearling chinook and steelhead peaked at Lower Granite around May 4 and at Little Goose around May 15. Good passage was being observed in the lower river. A question was asked about subyearling

passage at Lower Granite, to which Paul and Margaret Filardo, FPP, responded that work is being done to improve accuracy of counts with RSW installation. It was noted that as future decisions about spill and transportation are made, it will be important to understand the proportion of subyearling chinook taking advantage of spill through the system.

Adult spring chinook at Bonneville were on a downward trend, with 55,000 counted to date. Jack counts, at 11,345, remain very high. A suggestion was made that ocean conditions play a large role – ocean conditions are expected to be at least neutral if not favorable this year.

Power system – Nothing to report.

Water quality – Jim Adams, COE, reported on TDG exceedances at the Lower Monumental and Ice Harbor forebays. The spill caps went up to 28.5 kcfs at Little Goose and 22.6 kcfs at Lower Monumental after last weekend. With TDG exceedances expected at John Day and The Dalles, spill caps will drop at the projects. Jim noted that spill cap information is updated every two weeks on the TMT web page.

TMT Schedule

May 23 Conference Call Agenda

- Review Meeting Minutes: Finalize May 9 Official Minutes, May 16 Facilitator's Notes
- Grand Coulee Flood Control
- Dworshak Operations
- Report on Sturgeon Pulse/Libby Operations

May 30 Face to Face Meeting

Agenda Items Include:

- Review Meeting Minutes
- Priest Rapids Update
- Grand Coulee Flood Control
- Updated Flow Forecasts
- Dworshak Operations
- Libby Operations Scenarios
- Follow up on Snake River Transportation
- Operations Review

Columbia River Regional Forum
Technical Management Team Meeting
May 16, 2007

1. Welcome and Introductions

Today's TMT meeting was chaired by Cindy Henriksen and facilitated by Robin Harkless, with representatives from COE, NOAA, BPA, BOR, USFWS, CRITFC, FPC, Montana, Oregon, Idaho and Washington participating. The following is a summary (not a verbatim transcript) of the topics discussed and decisions made at the meeting. Anyone with questions or comments about these notes should provide them to the TMT chair or bring them to the next meeting.

2. Review Meeting Minutes

Regarding the May 9 facilitator's notes, Russ Kiefer offered a few edits to clarify the discussion of his request to consider maximum transportation if flow conditions deteriorate in late May. Under Snake River Transportation Operations, first page: transportation at Little Goose started on May 9, not at Lower Granite, and at Lower Monumental on May 11, rather than 11 days from today, Kiefer said. In the second paragraph regarding the Snake River system, he deleted "expecting to continue" and replaced it with "migration conditions for fish could deteriorate dramatically in late May."

Regarding the May 2 official meeting minutes, section 5, Priest Rapids Update, Cindy Henriksen (COE) asked whether the description of the four weekend conditions is correct in the current version posted on the website. Yes, Russell Langshaw (Grant County PUD) said. There were no other comments on the May 2 official minutes, so they can be considered final.

The May 9 and May 14 official meeting minutes will be posted on the web as soon as additional comments have been received, Jim Adams (COE) said. The May 9 minutes should be posted by the end of this week.

3. Priest Rapids Update

This has been another good week, Russell Langshaw (Grant County PUD) said. Starting May 7, there were 150 kcfs flow minimums. For the rest of the week, there were 60 kcfs flow bands. This past weekend, there were minimum flows of 170 kcfs, based on weekend protection measures discussed at the last TMT meeting. The mean minimum flows from Monday through Thursday that week presented a constraint the following weekend. There have been no exceedances downstream as a result of this operation. Discharges ranged from 1.8 to 24 kcfs, and daily deltas ranged from 1.3 kcfs to a maximum of 78.5 kcfs. Langshaw will give another update at the next face to face TMT meeting May 30.

4. Sturgeon Pulse/Libby Operations

Greg Hoffman (COE – Libby Dam) and Henriksen gave an update on operations since Monday's TMT conference call, when TMT discussed the SOR submitted by USFWS and local stakeholders including the state of Montana. That's when the COE learned that the request to initiate the sturgeon pulse would be triggered by water temperatures in Libby Reservoir and at Bonner's Ferry. In response to that focus, Hoffman presented TMT with a graph of temperature data at varying levels within Libby Reservoir. The current reservoir elevation is 2,400 feet.

The graph indicates that the temperature in the Libby forebay is increasing, particularly at lower elevations, Hoffman said. In the past, when reservoir surface temperatures increased, the COE responded by increasing the volume of the reservoir, which entrained the cooler water below and caused a double peak in the thermograph. We're trying to avoid that this time, Hoffman said. Temperatures in the upper layers of the reservoir were around 47 degrees Fahrenheit at the end of last week, and today they're around 53-54 degrees F, so the reservoir is warming rapidly. The temperature at Bonner's Ferry is 48.8 degrees Fahrenheit; typically, 50 degrees is a critical number for the sturgeon operation. It could start as early as Monday, May 21. The sturgeon pulse SOR will probably ask that the reservoir temperature be allowed to increase no more than 1.5 degrees Centigrade as a result of higher flows. Identifying the trigger will not be a black-and-white process, but rather an approximation of the time when flows from the dam are unlikely to cause water temperatures at Bonner's Ferry to drop.

The group reviewed the process for initiating the sturgeon operation. Several key TMT members on the sturgeon recovery team, including USFWS representative Jason Flory, will meet this Friday, May 18, at Libby Dam. It appears likely the sturgeon operation will begin Monday, based on information they gather at the dam Friday. Written commencement of the operation will most likely come from the COE rather than USFWS, as agreed upon at an earlier TMT meeting. Henriksen asked whether any TMT members objected to this process; no one did. There were requests to identify who was involved in the decision to start the operation and the conditions that were met.

5. Grand Coulee Flood Control

The maximum flood control elevation at present is 1,263 feet on May 20, John Roache (BOR) said. There will be a new flood control elevation calculated weekly, based on the current status of runoff and residual runoff to come. The purpose of the weekly elevation maximums is to keep the reservoir filling, but not too quickly, and the flow moving in the lower river, Henriksen said.

6. Snake River Transportation Operations

FPAC recently had a discussion with the Tribes who have an agreement for this year's spill operation, Paul Wagner (NOAA) said. The agreement clearly calls for spill throughout the migration season, regardless of flows. NOAA made a recommendation to rely more heavily than planned on transportation this year because of the way flows are shaping up. However, FPAC could not reach consensus on that recommendation, so no SOR was presented to TMT. Wagner said there was no point in submitting an SOR with partial representation – which has been done on other occasions – because Judge Redden has ordered that no changes may be made to the operations plan unless there is consensus among the signatories to the agreement.

Wagner expressed a sense of urgency about responding quickly when conditions warrant because river conditions will probably continue to deteriorate, making the pathway more perilous for fish. This year, in light of flow conditions, NOAA recommended transporting all spring migrants from Lower Granite to below Bonneville Dam. The main reason Wagner gave for requesting maximum transport is that SARs are higher for fish transported than those left to migrate in the river when flows are as low as they have been this year (average 72 kcfs).

Wagner quoted a NMFS memo that summarized several studies and thoughts on the effects of the hydro system: (1) A flow of 115 kcfs is the model threshold for steelhead, below which survival decreases; (2) the model threshold for spring Chinook is 72 kcfs, below which survival decreases. Another study indicated that 85 kcfs is the threshold at which steelhead are able to find their way past the dams. Installation of RSWs could change that, Wagner noted.

He presented several DART graphs based on studies of migration in 2002, a low-flow year similar to this one. A study of yearling Chinook smolts at Lower Granite found that they did not benefit from transport until May 15, when benefits suddenly increased. There were similar but less dramatic findings for yearling Chinook at Little Goose. The Science Center's current theory, Wagner said, is that ocean conditions drive sudden changes in SARs of fish transported. Studies show that steelhead benefit more consistently from transportation then spring Chinook, wild spring Chinook in particular. In 2002, there was a fourfold benefit for steelhead transported in season. Steelhead have shown the most consistent benefit, and they're also the most at risk.

The temperature at which survival decreases is 12.5 degrees Centigrade, or 54 degrees Fahrenheit, Wagner said. The temperature at Lower Monumental is now 55.3 degrees F in the forebay and 55.9 degrees F in the tailrace. Wagner emphasized that conditions in the river could continue to worsen, based on past trends. He explained that collecting approximately 80% of fish at some point in the river (according to the current operations plan) is not the same as collecting them at Lower Granite and transporting them downstream below Bonneville

Dam. Though the fish will be transported for short distances under this year's operations plan, they will still be subjected to risk as they move downstream. Wagner also pointed out that the transportation recommendation applied only to the remainder of spring migration season, not the entire summer.

Though there will be no SOR to advocate NOAA's transportation recommendation, Wagner advised TMT to keep this issue on the agenda when it's time for the end-of-year review, particularly in light of SARs findings. Studies indicate that when ocean conditions are good, transported fish do better in terms of SARs. The studies for 2002-03 showed that steelhead that migrated in river had SARs of 0.5, while those transported had SARs of nearly 2.0.

Litchfield suggested adding temperature data and tracking this issue in search of parameters to define when one tool is clearly more appropriate than another. The time to focus R&D on this issue is after the RSWs have all been installed and we've done what we can to make river passage less hazardous, Wagner said. Litchfield felt it was important for TMT to make operational recommendations on the record, even if the recommendations can't be implemented due to lack of consensus or a court order. He concurred with Wagner's view that river conditions for fish are generally deteriorating.

Dave Statler (Nez Perce) requested that subyearlings be included in the analysis of transport vs. in-river migration. Litchfield requested that the data charts be updated and that TMT revisit the maximum transport issue at its next meeting. Shane Scott (NWRP) wanted more biological justification of transportation vs. in river migration; he also wanted to hear the salmon managers' individual views. There was some discussion of court filing dates and how long the process might take if consensus could be reached tomorrow.

7. Updated Flow Forecasts

Henriksen presented updated hydrographs and whiskers plots for Libby, Dworshak, Hungry Horse and Lower Granite; there were no questions on these. She presented a graph of Dworshak augmentation volumes, which shows the augmentation volumes available in the same formats COE has been using to present inflow data to TMT.

The water supply forecast shows about 4.5 kcfs of average flow available if the salmon managers request flat flows for the duration of spring migration season, Henriksen said. That's outflow in excess of the 1.5 kcfs minimum flows, for a total of 6 kcfs. Scott Bettin (BPA) pointed out that the 1.5 kcfs is always released, meaning the chart shows volumes actually available for augmentation, excluding minimum flows. Other TMT members said this was a good clarification. The graph should say outflow volumes, not augmentation volumes, Henriksen agreed.

Regarding Libby augmentation volumes, refill is questionable by June 30, depending on how operations shape up in June, Henriksen said. The chart shows that in only 4 years does Libby fill and have excess volume under current flow conditions. Jim Litchfield asked COE to prepare the bookend scenarios of recent years, which use TESS scenarios to calculate reservoir elevations, given forecasted inflows and the sturgeon pulse. The COE is planning to produce those for 2007 once the sturgeon pulse starts, Henriksen said.

The Lower Granite data indicate that, on average, the reservoir will be 10 feet short of refill by June 30, or 500 kaf short of the refill goal, Wagner said. Though the graph shows an increase in flows to 104-5 kaf this weekend due to warmer temperatures, these forecasts should be taken with a grain of salt because they change daily, Henriksen cautioned.

8. Dworshak Operations

The quantity available for augmentation at Dworshak is diminishing, Henriksen reported. Recently the salmon managers settled on 5 kcfs as the appropriate outflow level, down from full powerhouse at 9,800 cfs. Wagner asked whether people are still comfortable with 5 kcfs outflow. It's better to err on the side of refill this year, he said.

According to the data, an average ESP of 5.1 kcfs has a 50% probability of allowing Dworshak to refill, while 3.4 offers a 75% probability of refill, Henriksen said. Litchfield agreed with Wagner that 5 kcfs remains a good choice for outflows now, with the expectation that outflows will probably need to be further cut back depending on inflows and other variables. Representatives of the Nez Perce Tribe, COE, Idaho and Montana also agreed to that operation for this week. A flat outflow of 4.5 to 5 kcfs from now through the end of June would have a 50% probability of achieving refill, Henriksen reminded TMT.

Scott Bettin asked about the unit loading. Running two small units would produce about 4.2 kcfs of outflow, Adams said. Wagner and Litchfield favored using the one big unit for now. This week the COE will operate the big unit with best efficiency, Henriksen said. The TMT agreed to discuss this issue on their conference call next Wednesday, with the expectation that unit loading will need to change to the smaller units next week.

9. Chum Emergence

Chum emergence appears to be over this season, Rick Kruger (Oregon) said. The 13 foot tailwater restriction, which is moot anyway, can be lifted. With that announcement, COE will remove the Warrandale gage until Sept. 1, Adams said; no one objected. This item will be deleted from future TMT agendas.

10. Operations Review

A. Reservoirs. Inflows at Libby have increased over the past week or so, with the reservoir spilling over 1.5 feet per day, Henriksen said. Inflows yesterday were 38 kcfs, and current elevation is 2,400 feet. Outflows will remain at 14 kcfs until the sturgeon pulse begins.

Grand Coulee is at elevation 1,253.1 feet and slowly filling, John Roache (BOR) said. The maximum flood control elevation is 1,263 feet on May 20.

Hungry Horse is at elevation 3,545.14 feet, within 15 feet of full (3,560 feet), Roache said. Discharges are 6.3 kcfs; inflows are 13-14 kcfs, forecasted to rise to around 17 kcfs in the next few days. With discharges at the current rate of 6.3 kcfs and inflows at around 15 kcfs, the reservoir fills at the rate of about ¾ foot per day. How quickly flows drop will drive decisions about discharges, Roache said. Because the reservoir is within 15 feet of refilling, decisions about operations need to be more reactive to changing inflows.

Dworshak is at elevation 1,581 feet, 19 feet from full. Inflows are 14-15 kcfs. Priest Rapids flows were 171 kcfs, meeting the flow objective.

McNary has had a seasonal average of 250-300 cfs (INFLOWS?) since April 20. Average flows at Lower Granite have been 70 kcfs since April 20.

Lake Pend Oreille is continuing to fill, with a target elevation of 2,060 feet at Albeni Falls by the end of May.

B. Fish. Peak Chinook passage at Lower Granite was May 4, with an index count of 220,000 fish, Wagner said. Yesterday's index count was down to 20,000. The passage index for spring Chinook at Lower Granite shows a similar trend, with a peak of 140,000 fish on May 4. Steelhead passage counts at Lower Granite are presently 91,000.

Dave Statler (Nez Perce) asked whether the index counts at Lower Granite will be revised to reflect actual passage efficiency with the RSW in place. That work is in progress and will be completed soon, Wagner and Margaret Filardo (FPC) agreed. Accurate information on passage efficiency will become increasingly important as TMT is faced with spill decisions throughout the season, Statler said.

Little Goose passed a peak of 370,000 steelhead on May 15, which indicates that steelhead are still migrating. Full sampling started on May 7 at Little Goose as part of collection for transport. The initial steelhead sample count was 36,000, with a peak count of 104,000 on May 15. This indicates that travel time is extended during low flow periods, Wagner said.

We have not seen the peak yet for steelhead on the lower Snake River, Wagner said. Overall numbers suggest that passage is somewhat slower this year than in 2002, with an expectation of 10-12 days for most fish to move through the lower Snake.

Meanwhile, it's prime passage time on the lower Columbia River. There was a peak index passage of 300,000 Chinook at John Day on May 12, and 145,000 fish at Bonneville on May 15, Wagner said. The subyearling Chinook counts at Bonneville reflect mainly Spring Creek Hatchery releases.

The good news this year is spring Chinook jacks, Wagner said. The tally of 11,345 so far – with 15 more days still to go – makes this year one of the top 2 or 3 on record for jack counts. The peak of 21,000 was in 2000. The Science Center believes that ocean conditions play an enormous role in such large returns, and this is believed to be a good year for ocean conditions, Wagner said. The hydro system sets the stage for anadromous fish, but the real drama happens in the ocean. He emphasized the importance of building fish populations during years of good ocean conditions because it's so difficult to maintain population levels during years of poor conditions.

Kyle Dittmer (CRITFC) said PDOs (WHAT'S THIS?) indicate that ocean conditions might be neutral this year. Wagner and Dittmer agreed that it would make sense to monitor ocean conditions when making decisions about the lower Columbia estuary.

C. Power. There is nothing new to report, Scott Bettin (BPA) said.

D. Water Quality. Jim Adams (COE) presented a chart showing water quality information which is linked to today's agenda. In May so far, there have been exceedances at Lower Monumental forebay 9 out of 16 days. There have been 7 exceedances in 16 days at Ice Harbor forebay. Therefore, the spill caps were raised on Monday to 26.8 kcfs at Little Goose and 21.5 at Lower Monumental. Wind and other conditions look favorable now, so the COE intends to raise the spill caps at Little Goose and Lower Monumental one stop apiece – 28.5 kcfs and 22.6 kcfs, respectively, Adams said.

There have been exceedances in The Dalles forebay, as well as the Bonneville forebay (115.9% TDG for both), he said. However, conditions for diffusing gas do not look good there, so the COE will drop the spill caps from 153.6 to 145 kcfs at John Day, and from 132 to 110 kcfs at The Dalles. Adams pointed out that 40% spill at The Dalles is just barely peaking over 110 kcfs, so by lowering the spill cap to that level, there should be 4 to 6 hours per day of actually spilling less than 40% of total outflow due to being constrained by the spill cap.

When the spill cap was raised recently to 30 kcfs at Little Goose, the graph shows TDG levels spiked at the Lower Monumental tailwater gage, Adams said, citing that as an example of the way small amounts of spill can cause a big spike in TDG levels.

15. Next TMT Meeting

There will be a conference call on May 23, 2007, to check in on Grand Coulee flood control operations, Dworshak operations, and the sturgeon pulse/Libby operations. The next face-to-face meeting will be May 30. Agenda items for that meeting will include a Priest Rapids update, and other issues to be determined, as well as the usual operations review. This meeting summary was prepared by consultant and writer Pat Vivian.

Name	***Affiliation***
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Cindy Henriksen	COE
Paul Wagner	NOAA
Jim Adams	COE
Laura Hamilton	COE
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Rick Kruger	Oregon
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